

REMARKS

In an Office Action mailed June 30, 2008, the Examiner made the following rejections:

1. Claims 1 and 5-6 were rejected under 35 U.S.C. § 102(a) over Applicant's admitted prior art.
2. Claims 29-30 were rejected under 35 U.S.C. 102(e) over U.S. Patent No. 7,035,595 (Kim).
3. Claim 2 was rejected under 35 U.S.C. 103(a) over the admitted prior art in view of U.S. Patent No. 7,016,654 (Bugeja).
4. Claim 3 was rejected under 35 U.S.C. 103(a) over the admitted prior art in view of U.S. Patent Publication No. 2002/0177423 (Cowley).
5. Claim 4 was rejected under 35 U.S.C. 103(a) over the admitted prior art in view of U.S. Patent No. 6,177,964 (Birleson).
6. Claims 18 and 20 were rejected under 35 U.S.C. 103(a) over the admitted prior art in view of U.S. Patent No. 4,361,906 (Sakamoto) and further in view of U.S. Patent Publication No. 2005/0239499 (Oosawa).
7. Claim 19 was rejected under 35 U.S.C. 103(a) over the admitted prior art in view of Sakamoto, Oosawa, and U.S. Patent No. 6,711,149 (Yano).
8. Claims 21 and 25 were rejected under 35 U.S.C. 103(a) over the admitted prior art in view of Sakamoto.
9. Claims 13 and 22 were rejected under 35 U.S.C. 103(a) over the admitted prior art in view of U.S. Patent No. 5,251,218 (Stone).
10. Claim 23 was rejected under 35 U.S.C. 103(a) over the admitted prior art in view of Stone and further in view of WO 97/06604 (Hedstrom).
11. Claim 24 was rejected under 35 U.S.C. 103(a) over the admitted prior art in view of Stone and further in view of Hedstrom and Birleson.
12. Claims 7 and 27-28 were rejected under 35 U.S.C. 103(a) over the admitted prior art in view of U.S. Patent Publication No. 2001/0041532 (Tomasz).
13. Claim 31 was rejected under 35 U.S.C. 103(a) over Kim in view of Cowley.
14. Claim 32 was rejected under 35 U.S.C. 103(a) over Kim in view of Birleson.
15. Claims 38 and 40 were rejected under 35 U.S.C. 103(a) over Kim in view of Sakamoto and further in view of Oosawa.

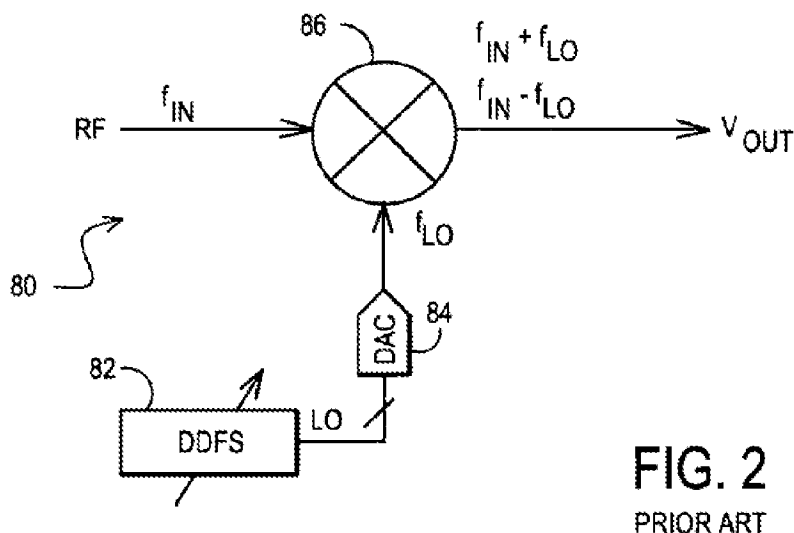
16. Claim 39 was rejected under 35 U.S.C. 103(a) over Kim in view of Sakomoto and further in view of Oosawa and Yano.
17. Claim 41 was rejected under 35 U.S.C. 103(a) over Kim in view of Sakomoto.
18. Claim 42 was rejected under 35 U.S.C. 103(a) over Kim in view of Sakomoto and further in view of Hedstrom.
19. Claims 34-36 were rejected under 35 U.S.C. 103(a) over Kim in view of U.S. Patent Publication No. 2003/0083033 (Staszewski).
20. Claim 37 was rejected under 35 U.S.C. 103(a) over Kim in view of Stone.
21. Claim 43 was rejected under 35 U.S.C. 103(a) over Kim in view of Tomasz and further in view of Sakamoto.
22. Claim 44 was rejected under 35 U.S.C. 103(a) over Kim in view of Sakomoto and further in view of Staszewski.
23. Claims 33 and 45-46 were rejected under 35 U.S.C. 103(a) over Kim in view of Tomasz.

Applicant addresses these rejections with reference to their corresponding rejection number(s) below.

1. With respect to the rejection of claims 1 and 5-6 over Applicant's admitted prior art (AAPA), the Examiner stated that "the second input of the mixer is not claimed to be directly coupled to the output terminal of the DDFS. Therefore the rejection to claim 1 is maintained." However this analysis is incorrect and contrary to law.

In construing the claims, the Office applies the "broadest reasonable interpretation consistent with the Specification." See Phillips v. AWH Corp., 415 F.3d 1303, 1316-1317, 75 USPQ2d 1321, ___ (Fed. Cir. 2005); accord, M.P.E.P. §2111. In the Final Office Action, however, the Examiner applied an interpretation of "coupled" that is so broad that it is *inconsistent* with the Specification.

First, Applicant described the technique used by the AAPA to *distinguish* the subject matter of the present claims. The AAPA shows a mixer 86 being driven by an analog local oscillator signal:



DAC 84 converts the output of DDFS 82 into an analog local oscillator signal and provides this analog signal to the second input of mixer 86. Thus, the mixing signal exists as an actual signal at frequency f_{LO} that can radiate around the chip and mix with other signals conducted on other signal lines, creating unwanted locking and spurs. Applicant recognized this problem and the advantage of using the digital output of a DDFS to drive a mixer. See, for example, paragraph [0051]: “This architecture of the present invention solves this problem because the LO mixing signal never exists as a physical signal on any circuit node, but rather exists as a collection of digital bits”, and later in paragraph [0074]: “Since there is no circuit node that contains an actual oscillator signal, as there would be with a conventional LC oscillator, there is no mechanism for the local oscillator signals to leak or radiate into other circuits, causing unwanted locking or spurs.”

In contrast, claim 1 recites “a mixer having . . . a second input terminal coupled to the output terminal of the direct digital frequency synthesizer”. Claim 1 is supported by, *inter alia*, FIG. 3:

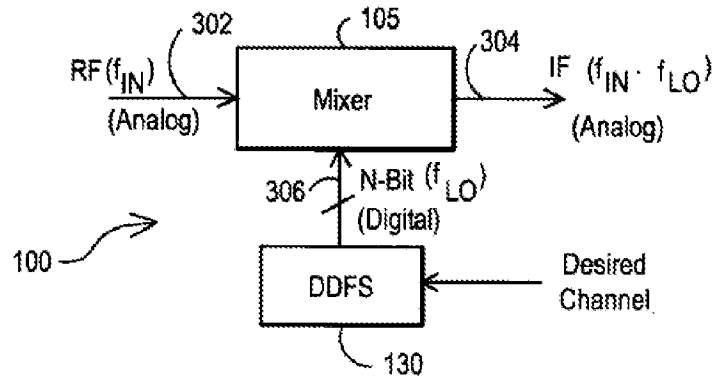


FIG. 3

Applicant could not have intended to claim as his invention subject matter he admitted he could not claim as his invention.

Second, the Specification states with respect to the AAPA in paragraph [0006]: “The output of DDFS 82 is *converted* into an analog signal using a digital-to-analog converter (DAC) 84 for input to a mixer 86 (emphasis added)”. The conversion of the digital signal into the analog signal prevents the output of the DDFS from being “coupled to” the input of the mixer.

Thus it is clear that Applicant could not have intended to, nor did he, draft claims that would have covered his own admitted prior art. To say that the word “coupled” is broad enough to cover what Applicant points to as prior art and distinguishes, would be inconsistent with the Specification. While the Examiner’s interpretation is broad, it is not consistent with the specification and is not reasonable. Therefore it is contrary to law and Applicant submits that the rejection of claims 1 and 5-6 is improper.

2. With respect to rejection of claim 29, note that claim 29 recites a step of “mixing the analog radio frequency signal with the digital local oscillator signal”. The Examiner uses the Kim patent to reject claim 29, but this step is not disclosed by Kim. Kim discloses very clearly in col. 4, lines 2-6 and FIG. 2 that the mixers are “driven by *local oscillator 205* controlled by a digital synthesizer 207 (emphasis added),” not by digital synthesizer 207:

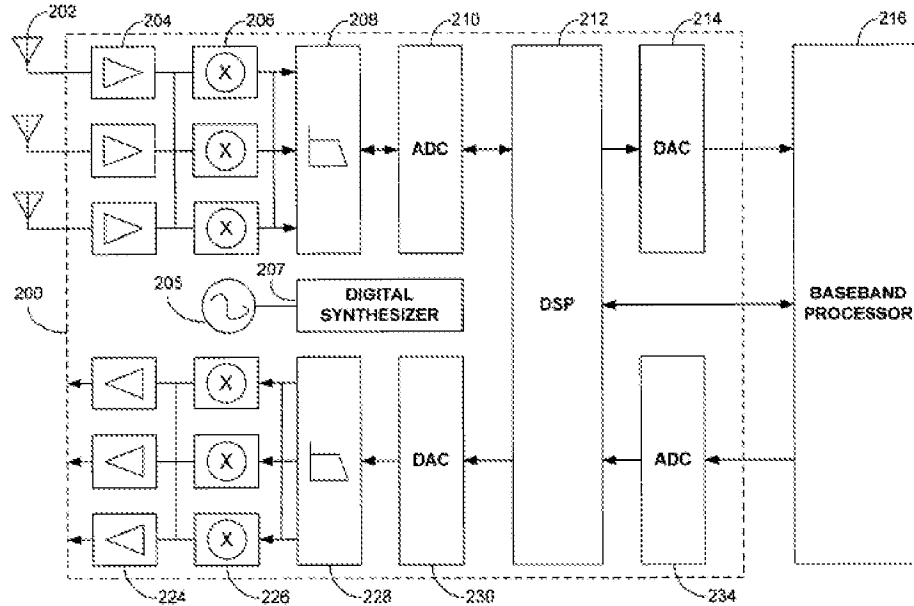


Figure 2A

Thus Kim simply cannot support a rejection under 35 U.S.C. 102(e).

Moreover in the face of Kim's lack of explicit disclosure of the type of signal output by local oscillator 205, there are at least three good reasons to infer that the mixing is conventional mixing using an analog local oscillator signal. First, Applicants themselves disclosed that the technique of using a DDFS and a DAC to generate an analog mixing signal was well known in the art. See the AAPA, FIG. 2 and the accompanying description. Second, if the output of local oscillator 205 were also digital, then local oscillator 205 would be redundant because digital synthesizer 207 already outputs a digital oscillator signal. Third, all the processing to the left of ADC 210 in the receive path is analog.

Yet in the face of a lack of explicit disclosure that local oscillator 205 outputs an analog signal, the Examiner concludes "Kim discloses a digital synthesizer which control [sic] the oscillator to generate a digital mixing signal." The Examiner's reasoning is known as an argument from silence, which is fallacious when used to make a logical conclusion. Moreover to the extent that Kim's silence supports *any* conclusion, it is that the output of local oscillator 205 is analog, as explained above.

3-23. With respect to the remaining rejections, note that they all depend on either the AAPA or

Kim. The Examiner has not alleged that the features missing from the AAPA or Kim are present or would have been obvious in view of any of these references. In fact none of the additional references disclose the missing features, nor would they have been obvious in view of any of these references. Thus the remaining rejections are all improper.

CONCLUSION

Thus Applicant submits that the rejections of claims 1-46 are improper and unsupportable. Applicant respectfully requests the reconsideration of the rejection of claims 1-46 and withdrawal thereof, thereby placing the application in condition for allowance.

The Commissioner is hereby authorized to charge any fees that may be required, or credit any overpayment, to Deposit Account Number 50-3797.

Respectfully submitted,

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Date

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